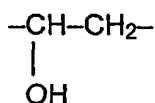


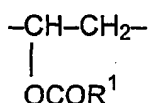
Claims

1. Heat-sensitive element comprising
- (a) an optionally pre-treated substrate
 - (b) a positive working heat-sensitive coating comprising
 - (i) at least one novolak resin,
 - (ii) at least one component which reduces the aqueous alkaline developer solubility of novolak, wherein said reduction in solubility is reversed upon the application of heat,
 - and
 - (iii) at least one acidic polyvinyl acetal comprising the structural units (A), (B), (C)

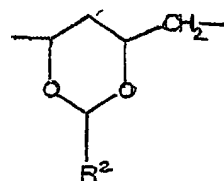
(A)



(B)

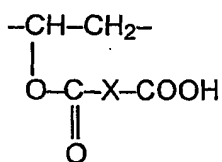


(C)

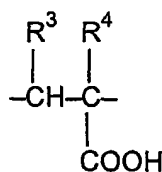


and (D), wherein (D) is at least one unit selected from (D-1), (D-2), and (D-3):

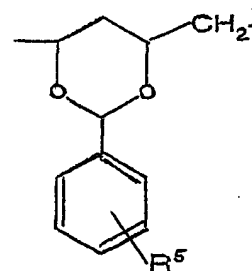
(D-1)



(D-2)



(D-3)



wherein

R^1 is a hydrogen atom or a $\text{C}_1\text{--C}_4$ alkyl group, R^2 is a hydrogen atom or a $\text{C}_1\text{--C}_{18}$ alkyl group, R^3 is a hydrogen atom or a $\text{C}_1\text{--C}_4$ alkyl group, R^4 is a hydrogen atom or a $\text{C}_1\text{--C}_4$ alkyl group, R^5 is ---COOH , $\text{---(CH}_2\text{)}_a\text{---COOH}$, $\text{---O---(CH}_2\text{)}_a\text{---COOH}$, $\text{---SO}_3\text{H}$, $\text{---PO}_3\text{H}_2$ or $\text{---PO}_4\text{H}_2$,

a is an integer from 1 to 8, and X is selected from



wherein n is an integer from 1 to 6,

each R^6 and R^7 is independently selected from a hydrogen atom and a $\text{C}_1\text{-C}_6$ alkyl group, and

R^8 and R^9 are independently selected from a hydrogen atom and a $\text{C}_1\text{-C}_6$ alkyl group or R^8 and R^9 , together with the two carbon atoms to which they are bonded, form an optionally substituted aryl or heteroaryl group,

wherein components (i) and (ii) do not have to be present as separate substances but may be used in the form of an appropriately functionalized novolak.

2. Heat-sensitive element according to claim 1, wherein component (ii) of the heat-sensitive coating is selected from cyanine dyes, triarylmethane dyes, quinolinium compounds, insolubilizers with ketone or sulfone group(s) and novolaks functionalized with substituents capable of forming a four-center hydrogen bridge bond.
3. Heat-sensitive element according to claim 1 or 2, wherein the structural units (A), (B), (C) and (D) are present in the following amounts in the polyvinyl acetal, based on the weight of the polyvinyl acetal:
 - (A) 10 to 40 wt.-%
 - (B) 0.1 to 25 wt.-%
 - (C) 10 to 80 wt.-%
 - (D) 1 to 40 wt.-%
4. Heat-sensitive element according to any of claims 1 to 3, wherein the polyvinyl acetal has an acid number of 10 to 160 mg KOH/g polymer.
5. Heat-sensitive element according to any of claims 1 to 4, wherein R^1 is $-\text{CH}_3$.

6. Heat-sensitive element according to any of claims 1 to 5, wherein R^2 is $-(CH_2)_2CH_3$.
7. Heat-sensitive element according to any of claims 1 to 6, wherein unit D has the formula D-1.
8. Heat-sensitive element according to claim 7, wherein X is selected from $-CH=CH-$.
9. Heat-sensitive element according to any of claims 1 to 6, wherein unit D has the formula D-2.
10. Heat-sensitive element according to claim 9, wherein R^3 and R^4 are each a hydrogen atom.
11. Heat-sensitive element according to any of claims 1 to 6, wherein unit D has the formula D-3.
12. Heat-sensitive element according to claim 11, wherein R^5 is selected from COOH.
13. Heat-sensitive element according to any of claims 1 to 12, wherein the novolak resin is present in an amount of 40 to 95 wt.-%, based on the dry layer weight.
14. Heat-sensitive element according to any of claims 1 to 13, wherein the component (ii) is present in an amount of 0.1 to 25 wt.-%, based on the dry layer weight.
15. Heat-sensitive element according to any of claims 1 to 14, wherein the polyvinyl acetal is present in an amount of 5 to 25 wt.-%, based on the dry layer weight.
16. Heat-sensitive element according to any of claims 1 to 15, wherein the heat-sensitive coating comprises at least one substance capable of absorbing radiation with a wavelength in the range of 750 to 1120 nm and converting it to heat.

17. Heat-sensitive element according to any of claims 1 to 16, wherein the heat-sensitive layer furthermore comprises at least one additive selected from polymer particles, surfactants, contrast dyes or pigments, and plasticizers.
18. Heat-sensitive element according to any of claims 1 to 16, said element being a lithographic printing plate precursor.
19. Heat-sensitive element according to claim 18, wherein the substrate is an aluminum substrate which prior to coating with the heat-sensitive coating was subjected to at least one treatment selected from (a) mechanical and/or chemical roughening, (b) anodizing and (c) application of a hydrophilizing layer.
20. Heat-sensitive element according to claim 18 or 19, wherein the dry layer weight of the heat-sensitive layer is 0.5 to 4.0 g/m².
21. Process for the production of a heat-sensitive element as defined in any of claims 1 to 20, comprising:
 - (a) providing an optionally pre-treated substrate,
 - (b) applying a solution comprising components (i), (ii), and (iii) as defined in any of claims 1 to 12, optionally comprising one or more additives selected from polymer particles, surfactants, contrast dyes or pigments, and plasticizers, and optionally comprising at least one substance capable of absorbing radiation with a wavelength in the range of 750 to 1120 nm and converting it to heat, and
 - (c) drying.
22. Process for imaging a heat-sensitive element comprising:
 - (a) providing a heat-sensitive element as defined in any of claims 1 to 20,
 - (b) image-wise exposure of the element with IR radiation or image-wise direct heating, and
 - (c) removing the imaged or directly heated areas of the coating by means of an aqueous alkaline developer.
23. Heat-sensitive composition comprising
 - (a) one or more organic solvents,
 - (b) at least one novolak,

- (c) at least one component which reduces the aqueous alkaline developer solubility of novolak, wherein said reduction in solubility is reversed upon the application of heat,
 - (d) at least one acidic polyvinyl acetal as defined in any of claims 1, 3, and 4 to 12, and
 - (e) optionally at least one additive selected from polymer particles, surfactants, contrast dyes or pigments, and plasticizers.
24. Heat-sensitive composition according to claim 23, wherein the composition additionally comprises at least one substance capable of absorbing radiation with a wavelength in the range of 750 to 1120 nm and converting it to heat.
25. Use of an acidic polyvinyl acetal as defined in any of claims 1, 3, and 4 to 12 for improving the solvent resistance of coatings of heat-sensitive elements whose heat-sensitive layer comprises a novolak resin and a component which reduces the aqueous alkaline developer solubility of novolak, wherein said reduction in solubility is reversed upon the application of heat.